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Numerical solving of highly viscous fluids filtration in porous media for nonlinear filtration laws with power growth

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Abstract

© 2018 Institute of Physics Publishing. All rights reserved. We study the steady-state filtration process of an incompressible high-viscosity fluid follows the nonlinear filtration law. The generalized statement of this problem is formulated in the form of an operator equation with a monotone operator in a Banach space. To solve this operator equation, we propose an iteration method that does not require the inversion of the original operator. Each step of the iterative process reduces to solving the boundary value problem for the Laplace equation. In the Matlab environment, a software complex was developed, with the help of which numerical calculations were performed for model filtration problems. The analysis of numerical results is carried out.

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